

What is claimed is:

1. A method for determining homocysteine in a bio-sample, comprising the following steps:

(a). adding a competing agent with an amino group to the bio-sample;

(b). adding an aldehyde compound to mixture (a) to form an fluorescent complex; and

(c). detecting the fluorescent intensity of mixture (b) to determine the amount of homocysteine in the bio-sample.

2. The method as claimed in claim 1, wherein the competing agent is tris-(hydroxymethyl)aminomethane (TRIS), acetamide, ethylamine or amine.

3. The method as claimed in claim 2, wherein the amine is a long-chained, branched, or cyclic compound with at least one amino-group.

4. The method as claimed in claim 1, wherein the bio-sample is serum or urine.

5. The method as claimed in claim 4, wherein the bio-sample contains homocysteine and cysteine.

6. The method as claimed in claim 5, wherein the aldehyde compound forms fluorescent complex only with homocysteine but not with the competing agent.

7. The method as claimed in claim 1, wherein the aldehyde compound is o-phthalaldehyde with a concentration from 1 to 100 mM.

8. The method as claimed in claim 1, wherein the total operation time from step (a) to step (c) is 4 to 15 minutes.

9. The method as claimed in claim 1, wherein the operation time between step (a) to step (b) is about 2 minutes.

10. The method as claimed in claim 9, wherein the operation time between step (b) and step (c) is about 2 minutes.

11. A method for determining homocysteine in the presence of cysteine in a bio-sample, comprising the following steps:

- (a). adding a competing agent containing tris-(hydroxymethyl)aminomethane (TRIS) to the bio-sample;
- (b). adding an o-phthalaldehyde into mixture (a) to form a fluorescent complex; and
- (c). detecting the fluorescent intensity of mixture (b) to determine homocysteine concentration thereof.

12. The method as claimed in claim 11, wherein the competing agent further comprises ethylenediamine tetraacetic acid (EDTA) and sodium borohydride.

13. The method as claimed in claim 12, wherein the concentration of tris-(hydroxymethyl)aminomethane (TRIS) is about 100 mM, the concentration of ethylenediamine tetraacetic acid (EDTA) is about 1 mM and the concentration of sodium borohydride is about 18 mM.

14. The method as claimed in claim 12, wherein the concentration of o-phthalaldehyde is from 1 to 100 mM in 20% ethanol solution.

15. The method as claimed in claim 14, wherein the operation time from step (a) to step (c) is from 4 to 15 minutes.

16. The method as claimed in claim 15, wherein the time between step (a) to step (b) is about 2 minutes.

17. The method as claimed in claim 16, wherein the time between step (b) to step (c) is about 2 minutes.

18. The method as claimed in claim 11, wherein the bio-sample is serum or urine.

19. A kit for homocysteine detection in a bio-sample containing homocysteine and cysteine, comprising:

- a competing agent, comprising at least one compound with an amino group; and
- a reactive agent that forms a fluorescent complex with homocysteine but does not form fluorescent complex with the competing agent.

20. The kit as claimed in claim 19, wherein the reactive stability of the competing agent and the reactive agent is higher than that of cysteine and the reactive agent, but lower than that of homocysteine and the reactive agent.

21. The kit as claimed in claim 19, wherein the competing agent is tris-(hydroxymethyl)aminomethane (TRIS), acetamide, ethylamine or amine.

22. The kit as claimed in claim 21, wherein the competing agent further comprises ethylenediamine tetraacetic acid (EDTA) and sodium borohydride.

23. The kit as claimed in claim 22, wherein the
5 concentration of tris-(hydroxymethyl)aminomethane (TRIS) is about 100 mM, the concentration of ethylenediamine tetraacetic acid (EDTA) is about 1 mM and the concentration of sodium borohydride is about 18 mM.

24. The kit as claimed in claim 21, wherein the
10 reactive agent comprises an aldehyde.

25. The kit as claimed in claim 24, wherein the aldehyde is o-phthalaldehyde.

26. The kit as claimed in claim 24, the concentration of o-phthalaldehyde is from 1 to 100 mM in ethanol solution.